CLAIMS

What is claimed is:

1. An injector for injecting a selected fuel into a fluid stream, comprising:

a fuel supply to supply the selected fuel;

a splash plate to spread a selected volume of the selected fuel;

an injector slot, having a slot width;

an aperture to allow the volume of the selected fuel from the fuel supply to leave said injector slot;

wherein said aperture provides a hydraulic diameter of the selected fuel in said injector slot less than about 80% of said slot width.

2. The injector of Claim 1, wherein said slot width is greater than about 0.02 inches.

3. The injector of Claim 1, further comprising an injector element defining a void to which the selected volume of the selected fuel is provided before being spread on said splash plate.

4. The injector of Claim 3, wherein said injector element further defines said aperture near said injector slot;

wherein said fuel is supplied from said void through said aperture to said injector slot in a substantially unitary structure.

5. The injector of Claim 3, further comprising:

a removable member operably sealing said void in a first selected position and removable to unseal said void;

wherein said plug may be removed to obtain access to at least said aperture.

6. The injector of Claim 1, further comprising:

a nose portion extending downstream of said injector slot;

wherein said nose portion of system directs a flow of a fluid.

7. The injector of Claim 6, wherein said nose portion includes an internal half-angle of about 2° to about 20°.

8. The injector of Claim 6, wherein said nose includes a planar portion defining a plane substantially perpendicular to a flow of a fluid past said nose;

wherein said planar portion is operable to achieve a selected holding flame.

9. The injector of Claim 1, further comprising:

a coolant pathway;

wherein said coolant pathway is operable to maintain a temperature of the injector during use.

10. The injector of Claim 1, further comprising:

an elongated member defining a plurality of said splash plates, a plurality of said injector slots, and a plurality of said apertures;

wherein at least one of said plurality of said splash plates, said apertures, and said injectors define a single injector portion for injecting the fuel into a selected area.

11. The injector of Claim 1, wherein said fuel supply is operable to supply at least one of hydrogen, methane, natural gas, Synthesis gas, and combinations thereof.

12. An injector for injecting a fuel into a gas powered turbine, comprising:

a combustion chamber in which a volume of the fuel is combusted;

an oxidizer supply to supply a selected oxidizer to said combustion chamber;

a preheat section to heat the oxidizer to a first temperature;

an oxidizer pathway to provide the oxidizer at the first temperature to said combustion chamber;

an injector slot near said oxidizer pathway; and

a splash plate to spread the volume of the fuel in said injector slot;

wherein the volume of the fuel substantially mixes with the oxidizer from said oxidizer pathway prior to combusting.

13. The injector of claim 12, further comprising:

an aperture through which the volume of the fuel is transferred from the fuel supply to the splash plate.

14. The injector of claim 13, wherein said injector slot has a slot width;

wherein said aperture provides a hydraulic diameter of the selected fuel less than about 80% of said slot width.

15. The injector of claim 13, further comprising:

an injector element defining at least said injector slot, said splash plate, and said aperture;

wherein said aperture is provided in a portion of said injector element to provide a fuel to the injector slot and said splash plate.

16. The injector of Claim 15, wherein said injector slot defines at least a portion of said splash plate;

wherein said aperture supplies fuel to said injector slot and at least a portion of said fuel engages said splash plate.

17. The injector of Claim 12, wherein said splash plate is operable to develop a sheet flow of fuel;

wherein injector slot provides the sheet flow of fuel into a stream of the oxidizer from said oxidizer pathway.

18. The injector of Claim 12, further comprising:

an injector plate defining at least a portion of said oxidizer pathway.

19. The injector of Claim 18, further comprising:

an injector face defined by said injector plate;

an injector nose extending downstream of said injector face, such that the oxidizer flows past said injector nose.

20. The injector of Claim 19, wherein said injector nose includes an internal angle of about 4° to about 20°.

21. The injector of Claim 19, wherein said injector nose defines a plane that allows a flow of the oxidizer past said injector nose substantially turbulence free.

22. The injector of Claim 12, wherein said splash plate produces a sheet flow of the fuel and said injector slot directs said sheet flow of fuel into a stream of oxidizer emanating from said oxidizer pathway;

wherein said sheet of fuel substantially mixes with said stream of oxidizer before any portion of the fuel combusts.

23. The injector of Claim 12, wherein the fuel includes at least a first fuel and a second fuel, wherein said first fuel and said second fuel are different.

24. The injector of Claim 22, wherein the fuel includes a first fuel and a second fuel, wherein said second fuel is different from said fuel.

25. The injector of Claim 24, wherein said first fuel is at least one of hydrogen, methane, natural gas, Synthesis gas, and combinations thereof; and

said second fuel is at least one of a hydrogen, a methane, a Synthesis gas, a natural gas, in combinations thereof.

26. A method of injecting a fuel into a gas powered turbine combustion chamber, comprising:

producing an oxidizer stream at a first temperature;

flowing the oxidizer stream near an injector slot;

spreading a fuel jet into the injector slot;

injecting the fuel from the injector slot into the oxidizer stream; and

combusting the fuel in a substantially uniform manner.

27. The method of Claim 26, further comprising:

providing an aperture to form said fuel jet into said injector slot;

wherein the fuel jet includes a hydraulic diameter substantially less than a selected dimension of said injector slot.

28. The method of Claim 26, wherein spreading a fuel jet into the injector slot includes engaging at least a portion of the fuel on a splash plate.

29. The method of Claim 26, wherein spreading a fuel jet into the injector slot includes forming a fuel sheet;

wherein injecting the fuel from the injector slot includes directing said fuel sheet into the oxidizer stream.

30. The method of Claim 26, further comprising:

directing the oxidizer stream pass the injector slot in a substantially turbulence free manner.

31. The method of Claim 26, further comprising:

holding a selected temperature relative to said injector slot.

32. The method of Claim 26, further comprising:

selecting a fuel.

33. The method of Claim 32, wherein selecting a fuel includes selecting a first fuel and a second fuel, wherein said first fuel is different from said second fuel; and

injecting said first fuel at a time different from injecting said second fuel.

34. The method of Claim 32, wherein selecting a fuel includes selecting at least one of a hydrogen fuel, a methane fuel, a natural gas, a Synthesis gas, and combinations thereof.